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Pulpwood Production in the North Central Region

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HIGHLIGHTS

NOTE: This report includes all primary products made from reconstituted wood fiber. In addition to wood pulp, this includes particleboard products[1] made from chips, shavings, wafers, flakes, strands, and sawdust. This report presents the production by county of the raw fiber material delivered to mills. Thus, these data report only that portion of the timber harvest used as raw material and do not necessarily reflect the volume of growing stock harvested.

LAKE STATES

Pulpwood production climbed to a record 8.1 million cords in 1988. Hardwoods constituted 76 percent of total pulpwood production. Aspen remained the dominant hardwood species harvested as roundwood—64 percent of the total. Whole-tree chip production rose to a new record high of 655 thousand cords—an 8-percent increase over last year. Aspen remained the main hardwood for whole-tree chip production. Production of pulpwood for pulp mills increased 6 percent, and production for particleboard mills climbed 5 percent. Pulpwood production in Michigan increased 4 percent over 1984's record high. New highs in hard maple, jack pine, soft maple, and white birch harvests were reached. Wisconsin pulpwood production expanded 7 percent. Production of pulpwood in Minnesota was up 2 percent over last year. The softwood harvest in Minnesota increased 34 percent over last year's harvest. The 1988 jack pine harvest of 285 thousand cords was the highest since 1982.

Softwood residue imports from Canada dropped from 32 thousand cords in 1987 to 24 thousand cords in 1988. Wisconsin mills used 516 thousand cords and Michigan mills used 258 thousand cords from out-of-State producers.

CENTRAL STATES

Pulpwood production in the Central States dropped 1 percent to 403 thousand cords. Hardwood residue comprised 68 percent of the total pulpwood production. Exports of pulpwood from the Central States declined 1 percent to 238 thousand cords over last year. Central States producers shipped wood to mills in Kentucky, Wisconsin, Oklahoma, Ohio, and Michigan. Indiana led pulpwood production in the Central States with 179 thousand cords or 45 percent of total production.

Receipts of pulpwood at Central States mills declined 2 percent to 161 thousand cords in 1988. Fewer than 500 cords of pulpwood were imported to the Central States in 1988.

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[1] *Haygreen, John G.; Bowyer, Jim L. An introduction to forest products and wood science. Ames, IA: The Iowa State University Press. 495 p.*

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Pulpwood Production in the North-Central Region, 1988

Ronald L. Hackett and W. Brad Smith

Pulpwood constitutes more than half the industrial timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri).

Current detailed information about pulpwood production[2] is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, forest industry development, and scientific studies.

Since 1979, we have included logs, bolts, and wood residue used in manufacturing flakeboard, waferboard, oriented strand board, and medium density fiberboard in this annual report. Together, these products are called particleboards, and all mills manufacturing these boards will be called particleboard mills in this paper. Wood used at particleboard mills is identical or nearly identical to wood used at pulp mills; therefore, including this wood in our study provides a more accurate estimate of demand for pulpwood-like material.

Because particleboard mills were in their infancy before 1979 and use primarily aspen and wood residue, including them does not distort roundwood use trends for other species nor preclude comparing 1988 survey results with those of 1978 and previous years.

Pulp and particleboard mills using North Central States timber in 1988 reported their pulpwood receipts[3] by species groups and counties of origin. This report presents the results of the survey, analyzes the data, compares results with those of 1987 or earlier years, and discusses trends in pulpwood production and use.

The Lake States and Central States are discussed separately because the timber types in each area are different, the flow of wood between the areas is nominal, and more detailed data on pulpwood production and receipts in the Central States would reveal the operations of individual mills. This is the 30th annual report of the pulpwood harvest in the Lake States counties and the 29th annual report of the Central States harvest.

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[2] *Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut, plus the annual wood residue volume produced by sawmills, veneer mills, etc. used for pulp, particleboard, waferwood, oriented strand board, or medium density fiberboard.*

[3] *Pulpwood receipts are the volume of wood received by mills in a specific State or region, regardless of the geographic source.*

Several mills purchase their pulpwood based on weight rather than volume. Conversion factors used in the Lake States to convert green tons of pulpwood to standard cord equivalents are shown in the Appendix. Conversion factors used in the Central States are shown in footnote 1 of table 5.

Pulpwood production in Minnesota is completely and accurately shown. However, to prevent disclosure of confidential information about softwood pulpwood use by individual companies, the total quantity of softwood pulpwood imports and exports between Minnesota and Canada is not reported. Thus, some Minnesota softwood shipped to Canada is shown as remaining and used in Minnesota, and receipts of Canadian softwood in Minnesota are understated.

LAKE STATES

Production

Pulpwood production climbed to a record 8.1 million cords[4] in 1988 from 7.7 million cords in 1987, a gain of 6 percent (table 1). New highs in output were reached in 6 of the last 8 years. Of each 100 cords produced, 92 were roundwood (including chips from roundwood) and 8 were residue[5] from wood-using plants.

Principal species harvested were aspen (3.7 million cords), jack pine (629 thousand cords), white birch (477 thousand cords), and hard maple (475 thousand cords). Other major species furnishing more than 200 thousand cords were balsam fir, red pine, spruce, and soft maple.

Hardwoods constituted 76 percent of the total pulpwood production. For the sixth consecutive year, pulpwood from hardwood residue exceeded 400 thousand cords. Hardwood pulpwood residue from the Lake States remained at the same level as last year (467 thousand cords). Aspen remained the dominant roundwood harvested—64 percent of the total. White birch (477 thousand cords), hard maple (475 thousand cords), and soft maple (394 thousand cords) were at record production levels in 1988.

Softwood roundwood production reached its highest level since 1982 with a total of 1.8 million cords. Pulpwood production from softwood residue climbed to 183 thousand cords, an increase of 5 percent. Increases in jack pine (629 thousand cords), red pine (323 thousand cords), balsam fir (360 thousand cords), and spruce (282 thousand cords) offset minor losses in white pine, tamarack, and cedar.

Whole-tree chip[6] (WTC) production in the Lake States increased by 8 percent to a record high of 655 thousand cords, about 8 percent of total production. Compared to 1987, the WTC mix contained less softwoods and more aspen and other hardwoods. Production of WTC by species group and State was:

State	Softwoods	Aspen	Other hardwoods
	Thousand cords		
Michigan	70	227	237
Minnesota	—	70	7
Wisconsin	—	30	14

Michigan—Total pulpwood production rose to a record high of 2.9 million cords, a 7-percent increase over 1987's total of 2.7 million cords. New highs in hard maple, jack pine, soft maple, and white birch output were reached. Declines in white pine, beech, and red oak production were not severe enough to reduce total production. The Western Upper Peninsula Survey Unit had a 17-percent increase in production over 1987. Leading roundwood producing counties statewide were Marquette, Delta, Menominee, Ontonagon, Dickinson, and Schoolcraft.

[4] *All references to cords are in standard cords. A standard cord is 128 cubic feet of wood, bark, and air space.*

[5] *Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using mills that is used for pulping and particleboard. Residue includes slabs, edgings, veneer cores, sawdust, wood flour, and chips manufactured from slabs, edgings, and veneer cores.*

[6] *Pulpwood produced from chipping entire trees (all portions of trees above ground, except the stumps).*

Table 1.- -Production and imports of pulpwood, Lake States, 1988

(In standard cords, unpeeled)

Species and Destination	Production by State1/				Imports			Total receipts
	Michigan	Minnesota	Wisconsin	Regional Total	Other U.S. 2/	Canada	Total imports	
Cedar								
Michigan	30,791	--	--	30,791	--	--	--	30,791
Total	30,791	--	--	30,791	--	--	--	30,791
Balsam fir								
Michigan	105,897	--	1,770	107,667	--	--	--	107,667
Minnesota	--	165,595	17,987	183,582	--	--	--	183,582
Wisconsin	7,634	147	51,042	58,823	--	--	--	58,823
Exported 3/	4,950	4,771	--	9,721	--	--	--	--
Total	118,481	170,513	70,799	359,793	--	--	--	350,072
Hemlock								
Michigan	32,870	--	134	33,004	--	--	--	33,004
Wisconsin	2,003	--	45,895	47,898	--	--	--	47,898
Total	34,873	--	46,029	80,902	--	--	--	80,902
Jack pine								
Michigan	192,856	--	121	192,977	--	--	--	192,977
Minnesota	--	83,317	5,256	88,573	--	--	--	88,573
Wisconsin	58,229	6,623	279,536	344,388	--	--	--	344,388
Exported 3/	--	2,730	--	2,730	--	--	--	--
Total	251,085	92,670	284,913	628,668	--	--	--	625,938
Red pine								
Michigan	25,727	--	--	25,727	--	--	--	25,727
Minnesota	--	22,604	4,752	27,356	--	--	--	27,356
Wisconsin	6,919	3,236	259,369	269,524	15	--	15	269,539
Exported 3/	--	521	--	521	--	--	--	--
Total	32,646	26,361	264,121	323,128	15	--	15	322,622
White pine								
Michigan	12,009	--	--	12,009	--	--	--	12,009
Minnesota	--	1,502	103	1,605	--	--	--	1,605
Wisconsin	2,137	38	25,360	27,535	--	--	--	27,535
Exported 3/	--	521	--	521	--	--	--	--
Total	14,146	2,061	25,463	41,670	--	--	--	41,149
Spruce								
Michigan	60,589	--	631	61,220	--	--	--	61,220
Minnesota	51	105,806	3,129	108,986	--	--	--	108,986
Wisconsin	25,320	30,483	39,411	95,214	--	1,726	1,726	96,940
Exported 3/	6,854	9,392	--	16,246	--	--	--	--
Total	92,814	145,681	43,171	281,666	--	1,726	1,726	267,146
Tamarack								
Michigan	4,082	--	--	4,082	--	--	--	4,082
Minnesota	--	9,801	--	9,801	--	--	--	9,801
Wisconsin	873	912	4,342	6,127	--	--	--	6,127
Total	4,955	10,713	4,342	20,010	--	--	--	20,010
Ash								
Michigan	22,531	--	2,950	25,481	--	--	--	25,481
Minnesota	--	1,381	617	1,998	--	--	--	1,998
Wisconsin	3,275	1,012	57,619	61,906	--	--	--	61,906
Total	25,806	2,393	61,186	89,385	--	--	--	89,385
Aspen								
Michigan	898,905	--	48,448	947,353	--	--	--	947,353
Minnesota	--	1,462,590	33,100	1,495,690	--	1,064	1,064	1,496,754
Wisconsin	110,203	23,559	1,089,688	1,223,450	--	--	--	1,223,450
Exported 3/	--	14,582	--	14,582	--	--	--	--
Total	1,009,108	1,500,731	1,171,236	3,681,075	--	1,064	1,064	3,667,557
Balsam poplar								
Michigan	33,427	--	47	33,474	--	--	--	33,474
Minnesota	--	46,110	2,257	48,367	--	--	--	48,367
Total	33,427	46,110	2,304	81,841	--	--	--	81,841
Basswood								
Michigan	45,803	--	7,495	53,298	--	--	--	53,298
Wisconsin	849	--	15,457	16,306	--	--	--	16,306
Total	46,652	--	22,952	69,604	--	--	--	69,604
Beech								
Michigan	39,599	--	442	40,041	--	--	--	40,041
Wisconsin	3,229	--	2,104	5,333	--	--	--	5,333
Total	42,828	--	2,546	45,374	--	--	--	45,374

(Table 1 continued on next page)

(Table 1 continued)

Species and destination	Production by States1/				Imports			Total receipts
	Michigan	Minnesota	Wisconsin	Regional total	Other U.S.2/	Canada	Total imports	
White birch								
Michigan	181,852	1,633	59,550	243,035	--	--	--	243,035
Minnesota	--	666	--	666	--	--	--	666
Wisconsin	3,162	11,049	219,124	233,335	--	--	--	233,335
Total	185,014	13,348	278,674	477,036	--	--	--	477,036
Yellow birch								
Michigan	67,386	--	12,410	79,796	--	--	--	79,796
Wisconsin	6,708	--	22,797	29,505	--	--	--	29,505
Total	74,094	--	35,207	109,301	--	--	--	109,301
Cottonwood								
Michigan	1,496	--	--	1,496	--	--	--	1,496
Total	1,496	--	--	1,496	--	--	--	1,496
Elm								
Michigan	26,820	--	2,546	29,366	--	--	--	29,366
Wisconsin	433	--	28,739	29,172	--	--	--	29,172
Total	27,253	--	31,285	58,538	--	--	--	58,538
Hickory								
Michigan	1,270	--	--	1,270	--	--	--	1,270
Wisconsin	--	--	53	53	--	--	--	53
Total	1,270	--	53	1,323	--	--	--	1,323
Hard maple								
Michigan	233,549	--	48,983	282,532	--	--	--	282,532
Wisconsin	31,864	--	160,237	192,101	--	--	--	192,101
Total	265,413	--	209,220	474,633	--	--	--	474,633
Soft maple								
Michigan	221,418	--	24,880	246,298	--	--	--	246,298
Minnesota	--	5,402	3,151	8,553	--	--	--	8,553
Wisconsin	11,675	957	126,282	138,914	--	--	--	138,914
Total	233,093	6,359	154,313	393,765	--	--	--	393,765
Red oak								
Michigan	87,794	--	6,895	94,689	--	--	--	94,689
Minnesota	--	--	1,139	1,139	--	--	--	1,139
Wisconsin	1,669	--	52,712	54,381	--	--	--	54,381
Total	89,463	--	60,746	150,209	--	--	--	150,209
White oak								
Michigan	40,011	--	--	40,011	--	--	--	40,011
Wisconsin	17	--	15,007	15,024	--	--	--	15,024
Total	40,028	--	15,007	55,035	--	--	--	55,035
Other hardwoods								
Michigan	15,158	--	3,846	19,004	--	--	--	19,004
Wisconsin	4,483	--	7,038	11,521	--	--	--	11,521
Total	19,641	--	10,884	30,525	--	--	--	30,525
Total roundwood								
Michigan	2,381,840	1,633	221,148	2,604,621	--	--	--	2,604,621
Minnesota	51	1,904,774	71,491	1,976,316	--	1,064	1,064	1,977,380
Wisconsin	280,682	78,016	2,501,812	2,860,510	15	1,726	1,741	2,862,251
Exported 3/	11,804	32,517	--	44,321	--	--	--	--
Total	2,674,377	2,016,940	2,794,451	7,485,768	15	2,790	2,805	7,444,252
Residue, softwoods								
Michigan	61,161	--	641	61,802	--	1,067	1,067	62,869
Minnesota	--	44,297	8,502	52,799	--	--	--	52,799
Wisconsin	8,424	544	47,134	56,102	101,600	22,919	124,519	180,621
Exported 3/	--	12,354	--	12,354	--	--	--	--
Total	69,585	57,195	56,277	183,057	101,600	23,986	125,586	296,289
Residue, hardwoods								
Michigan	153,930	--	11,093	165,023	22,562	203	22,765	187,788
Minnesota	--	53,437	--	53,437	--	--	--	53,437
Wisconsin	21,986	--	222,333	244,319	19	--	19	244,338
Exported 3/	--	3,617	190	3,807	--	--	--	--
Total	175,916	57,054	233,616	466,586	22,581	203	22,784	485,563
All wood material								
Michigan	2,596,931	1,633	232,882	2,831,446	22,562	1,270	23,832	2,855,278
Minnesota	51	2,002,508	79,993	2,082,552	--	1,064	1,064	2,083,616
Wisconsin	311,092	78,560	2,771,279	3,160,931	101,634	24,645	126,279	3,287,210
Exported 3/	11,804	48,488	190	60,482	--	--	--	--
Total	2,919,878	2,131,189	3,084,344	8,135,411	124,196	26,979	151,175	8,226,104

1/Vertical columns of figures under the box heading "Production by States", present the amount of pulpwood cut in each State.
2/Mostly Western States.
3/Pulpwood shipped to mills outside of region.

Minnesota—Production increased 2 percent to 2.1 million cords, but failed to top 1984's production of 2.15 million cords. Major gains occurred in the Northern Pine Survey Unit. Softwood roundwood production increased 115 thousand cords (34 percent) over last year. Aspen dropped slightly from 1.6 million cords in 1987 to 1.5 million cords in 1988. White pine production dropped to its lowest recorded level with 2 thousand cords harvested. St. Louis County had the highest roundwood production with 475 thousand cords, but this was a drop of 110 thousand cords from last year. Itasca County increased production 40 percent to 400 thousand cords in 1988. Counties that produced more than 100 thousand cords were St. Louis, Itasca, Koochiching, Beltrami, Cass, and Lake.

Wisconsin—Production expanded 7 percent to 3.1 million in 1988. The increased production was mainly in aspen—about 13 percent. Increases in aspen output occurred mainly in the Northeast and Northwest Survey Units. Jack pine production of 285 thousand cords topped the previous record high of 253 thousand cords cut in 1982. Other species at peak production in 1988 were red pine (264 thousand cords), white birch (279 thousand cords), and yellow birch (35 thousand cords). Softwood residues for pulpwood provided an all time high of 56 thousand cords. Top-producing counties were Marinette, Bayfield, Sawyer, Oneida, and Vilas.

In this report, we show the distribution of the harvest in two ways: first, the amount of pulpwood cut relative to the growing-stock volume in each of five major pulpwood species (fig. 1); and, second the amount of pulpwood relative to commercial timberland area (fig. 2). Pulpwood harvesting was most intensive in the following areas by species:

Species	State	Survey Unit
Jack pine	Wisconsin	Northeast and Central
	Michigan	Northern Lower Peninsula
		Eastern Upper Peninsula
Red pine	Wisconsin	Central
Spruce	Michigan	Eastern Upper Peninsula
	Minnesota	Aspen-Birch
Balsam fir	Michigan	Eastern Upper Peninsula
	Minnesota	Aspen-Birch
Aspen	Minnesota	Aspen-Birch, Northern
Pine	Wisconsin	Northeast, Northwest
	Michigan	Northern Lower Peninsula

Cutting of certain species may exceed net growth in several Survey Units of the Lake States. This disparity is probably due to disease and mortality occurring in these species. Harvesting of overmature stands of timber may be another reason. Future field surveys should help clarify these points.

Receipts

Thirty-six woodpulp and twelve particleboard mills received 8.2 million cords of pulpwood in 1988, up 5 percent from 1986. Of these operating mills, 43 used aspen, 21 used birch, and 20 used maple (table 3).

The Lake States provide many pulpwood mills with raw material. In 1988, Wisconsin supplied wood to 28 mills, Michigan supplied 27 mills, and Minnesota supplied 25 mills. Pulpwood mills outside the Lake States also received raw material from this region. Some 60 thousand cords were exported, mainly to Canada; Minnesota exported 48 thousand cords, Michigan exported 12 thousand cords, and Wisconsin exported 190 cords.

Softwood residue from Canada dropped 20 percent in 1988 after rebounding to 30 thousand cords in 1987. Softwood residue imported from other States increased 15 percent to 102 thousand cords. The main suppliers of the softwood residue from outside the Lake States are South Dakota and Wyoming.

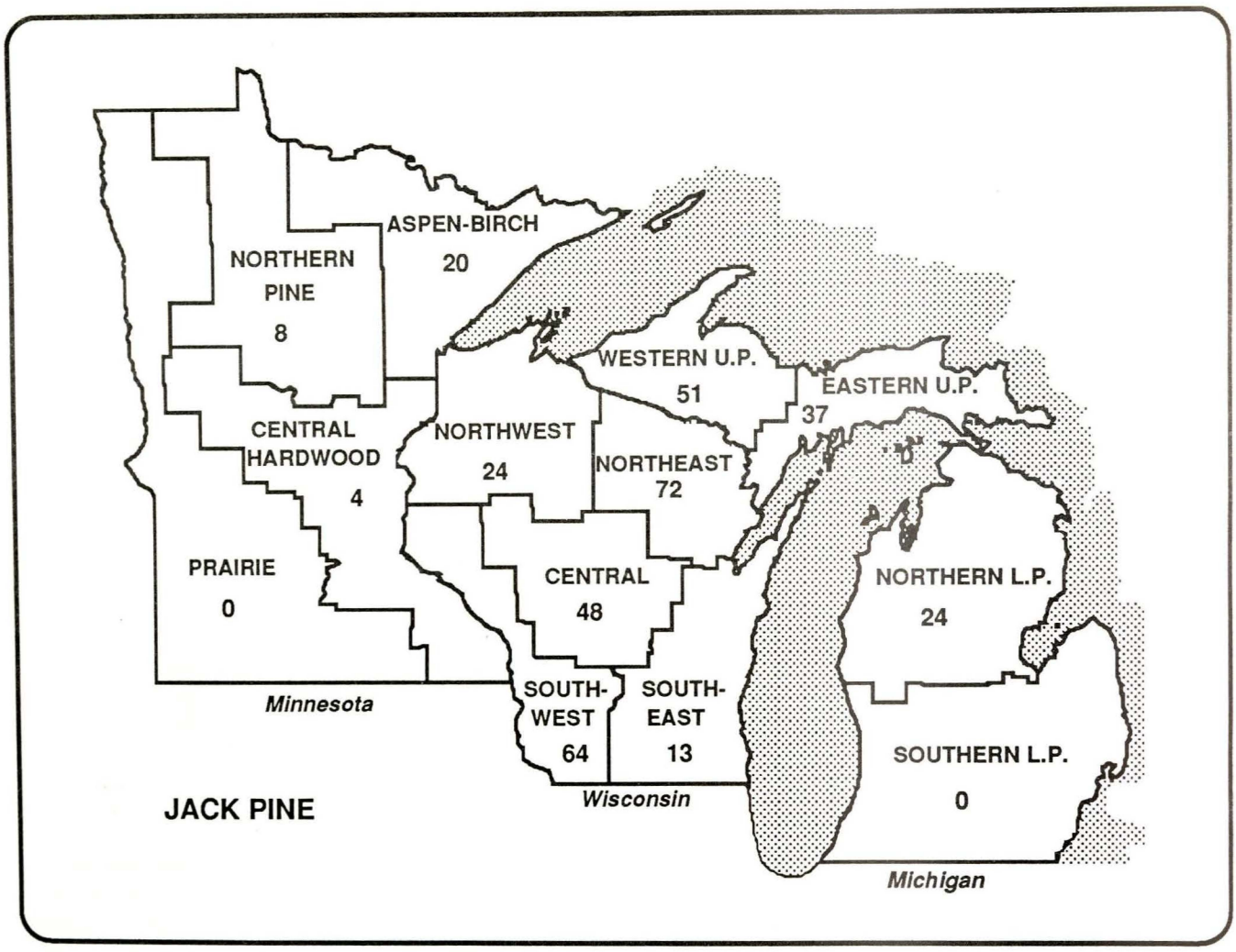


Figure 1.—*Cords of roundwood pulpwood (including chips from roundwood) harvested per 1,000 cords of growing-stock volume for each of five principal pulpwood species by Forest Survey Unit, 1988. Growing-stock volume was determined during the last forest inventory in each State.*

Michigan—Eleven Michigan mills consumed 2.9 million cords. An estimated 258 thousand cords were supplied by out-of-State sources. Wisconsin provided more than 90 percent of the imported wood. White birch, hard maple, aspen, and soft maple were the primary species imported.

Wisconsin—The 22 mills in Wisconsin consumed 3.3 million cords. Of that total, 516 thousand cords were supplied by out-of-State sources. Michigan supplied 311 thousand cords, Minnesota 79 thousand cords, and Canada 25 thousand cords. Principal imports were aspen, spruce, jack pine, and hardwood residue.

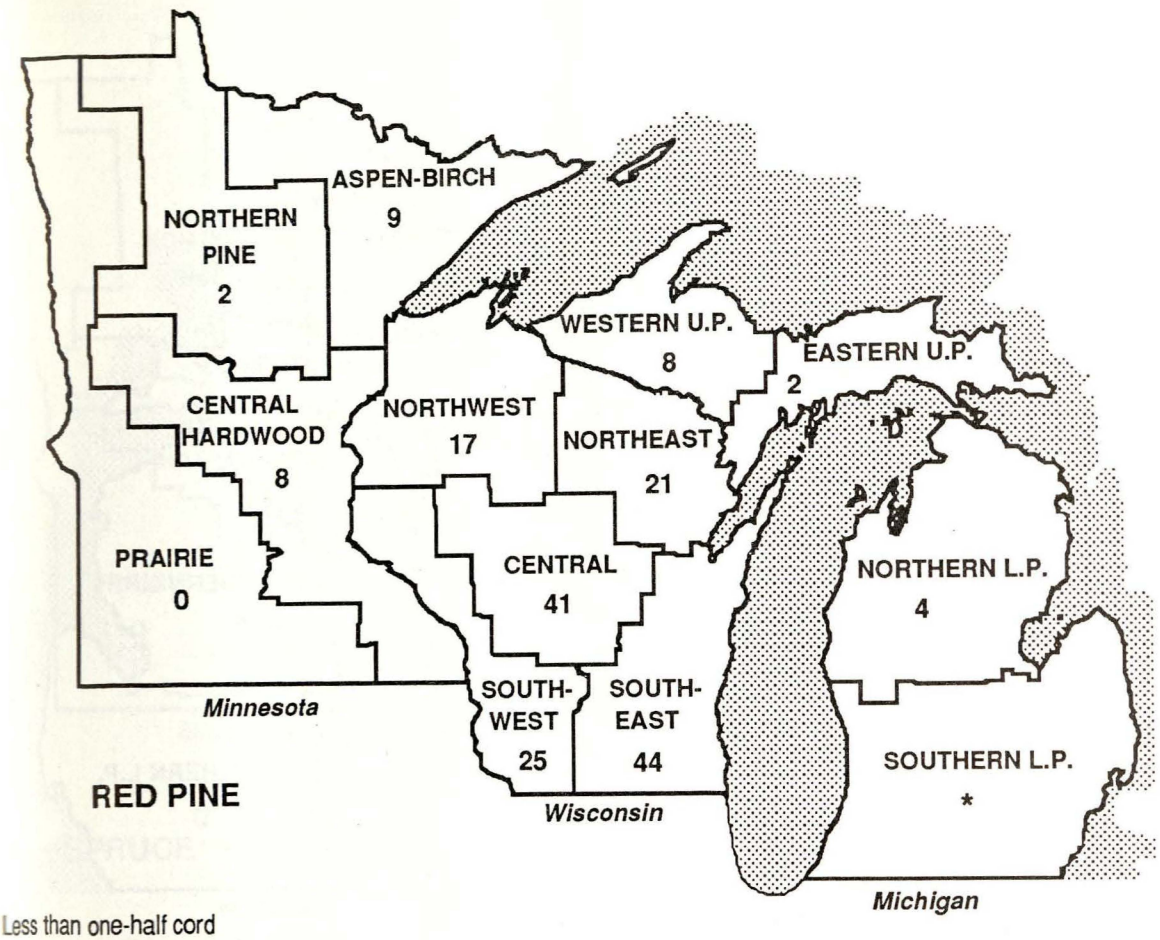
Minnesota—Minnesota pulpwood receipts are not fully reported (see earlier explanation). Wisconsin supplied 79 thousand cords, Michigan 51 cords, and Canada 1 thousand cords. Principal imports were aspen, balsam fir, softwood residue, jack pine, red pine, and soft maple.

Industry Trends and Analysis

Pulp mills

Average daily woodpulp production was 12.2 thousand tons per day in 1988 (table 4). Kraft mills accounted for one-third of the total production, and groundwood and other mechanical

(Figure 1 continued)



* Less than one-half cord

process mills accounted for another one-third. The remaining one-third was split between sulfite process mills and semi-chemical process mills.

Lake States pulpwood production for pulp mills in 1986-1988 was:

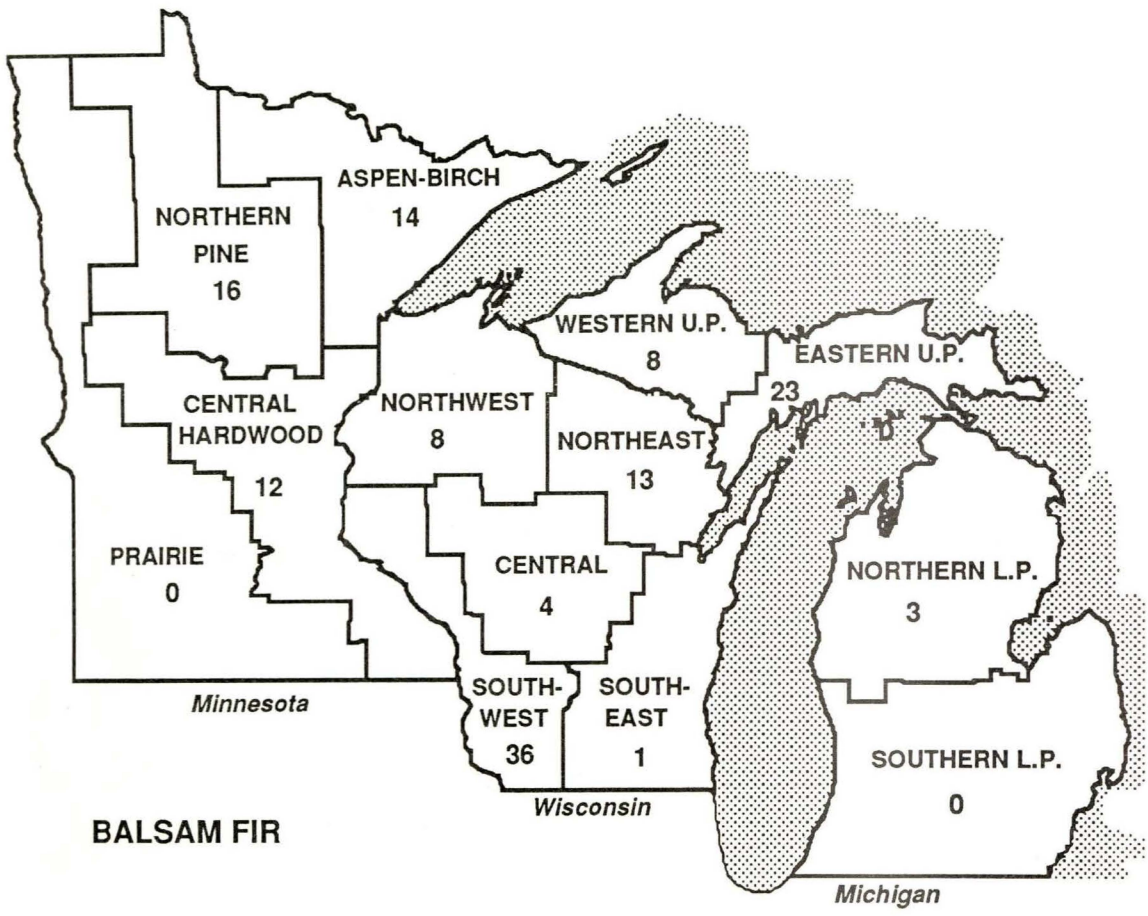
Species	Production		
	1986	1987	1988
	Thousand cords		
Roundwood			
Aspen	2,202	2,030	2,077
Softwoods	1,429	1,395	1,632
Other species	1,781	1,824	1,888
Residue	470	524	519
Total	5,882	5,773	6,116

A 6 percent increase in pulpwood production for pulp mills in the Lake States during 1988 compares favorably with the 3.1 percent rise in U.S. paper and paperboard production that year.

Particleboard mills

A new mill at Sagola, Michigan, began operating in 1988. Annual production capacity of the Lake States particleboard plants is 1,330 million square feet, as shown on the next page:

(Figure 1 continued)



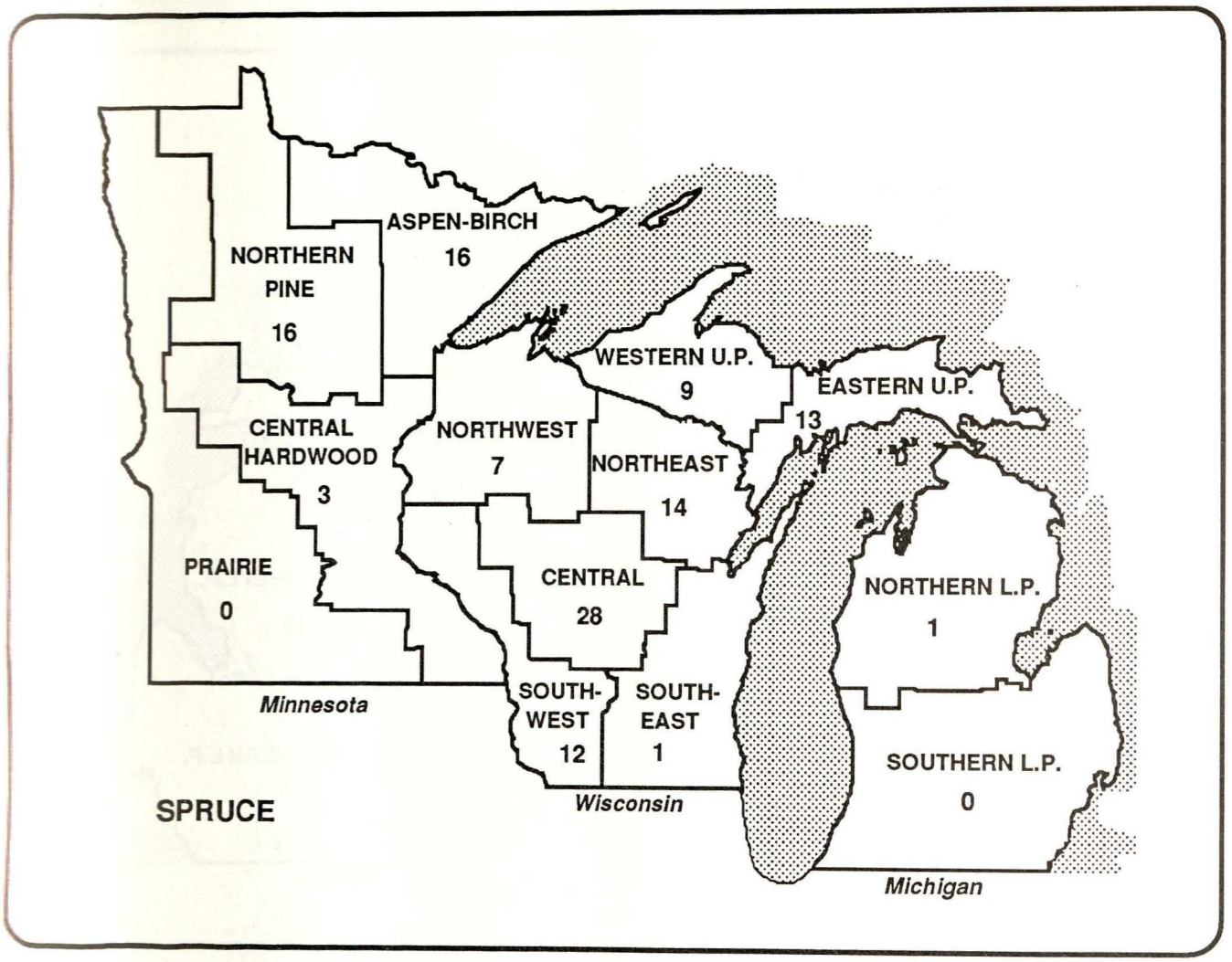
Company	Location	Production capacity *Million square feet 3/4-inch basis*
Georgia-Pacific	Gaylord, MI	175
Louisiana-Pacific	Newberry, MI	50
Louisiana-Pacific	Sagola, MI	140
Weyerhaeuser Co.	Grayling, MI	170
Louisiana-Pacific	Two Harbors, MN	75
Blandin Wood Products Co.	Grand Rapids, MN	150
Northwood Panelboard Co.	Bemidji, MN	130
Potlatch Corp.	Bemidji, MN	110
Potlatch Corp.	Cook, MN	105
Louisiana-Pacific	Hayward, WI	130
Rodman Industries	Marinette, WI	30
Weyerhaeuser Co.	Marshfield, WI	65
All companies		1,330

Lake States pulpwood production for particleboard mills in 1986-1988 was:

Species	Production 1986	1987	1988
	Thousand cords		
Roundwood			
Aspen	1,455	1,542	1,605
Softwoods	140	145	135
Other species	119	118	148
Residue	117	116	131
Total	1,831	1,921	2,019

Lakes States pulpwood production for particleboard products increased 5 percent during 1988. A strong export and non-housing market for particleboard products accounted for this increase. Nationally housing starts dropped 8.2 percent in 1988 to 1.5 million units.

(Figure 1 continued)



New Mills and Expansions

Two major pulp mill expansions are scheduled to be completed in 1989, and another will be finished in 1990. A large expansion of one particleboard mill and the construction of another have been approved.

CENTRAL STATES

Production

Pulpwood production in the Central States dropped 1 percent from the 1987 production of 403 thousand cords. Hardwood residue comprised 68 percent of the total production. Softwood roundwood remained at last year's level; however, soft hardwood[7] and hard hardwood[8] roundwood dropped 14 percent and 3 percent, respectively. Exports from the Central States (mainly hardwood residue) declined 1 percent to 238 thousand cords. Central States producers shipped wood to Kentucky, Wisconsin, Oklahoma, Ohio, and Michigan mills.

The four Central States produced more pulpwood in 1988 than in 1987. Indiana led with 45 percent of the total, followed by Missouri with 25 percent, Illinois with 23 percent, and Iowa with 7 percent.

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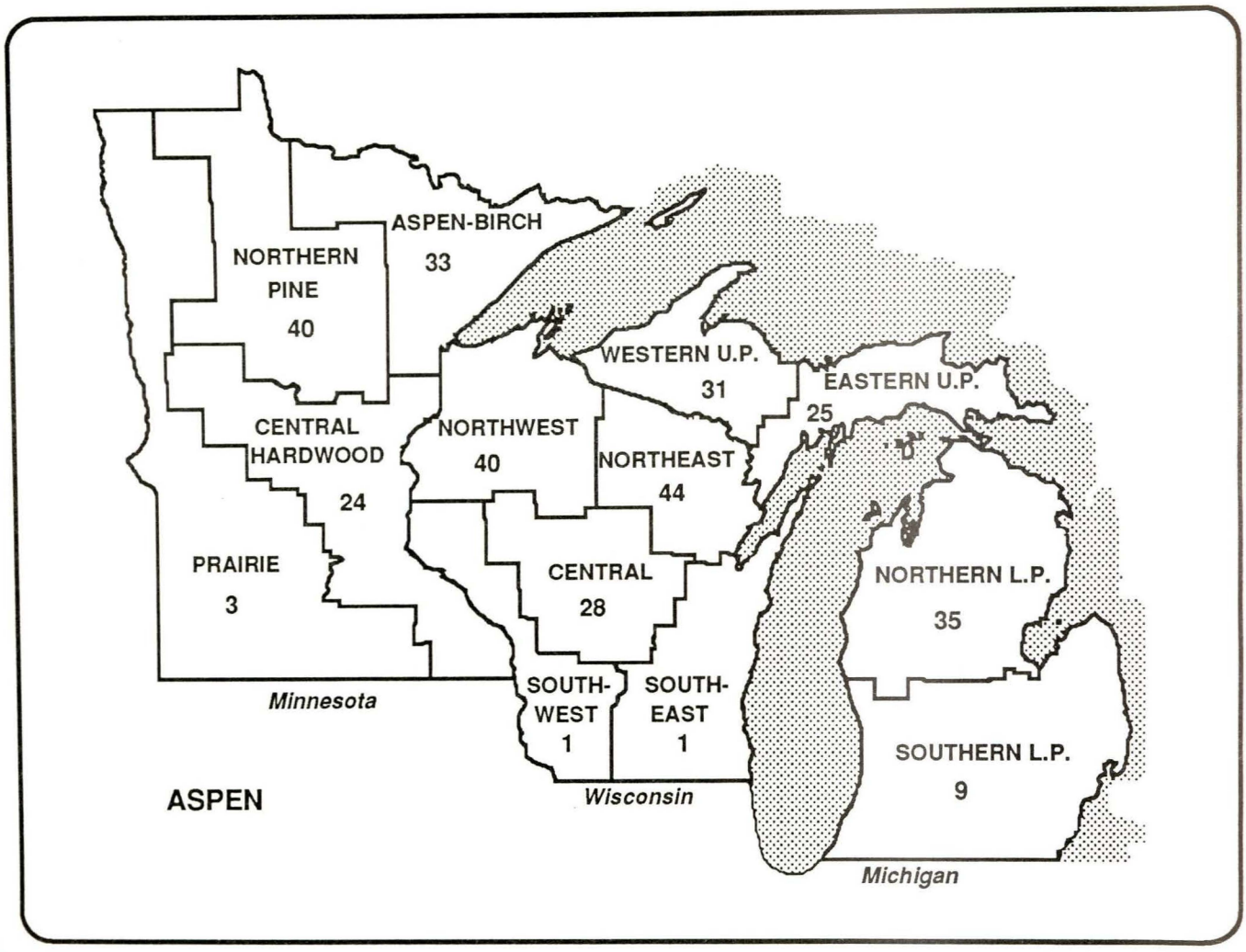
[7] *Hardwood species with an average specific gravity of 0.50 or less.*

[8] *Hardwood species with an average specific gravity greater than 0.50.*

(Figure 1 continued)



Loggers harvested pulpwood in 19 counties of Illinois; 16 counties in western and central Indiana; 10 counties in eastern Iowa; and 12 counties in northeast, central, and southeast Missouri (fig. 3). Illinois production areas dropped from 26 to 19 counties in 1988.

Receipts

Pulp mills in three Central States received 161 thousand cords in 1988, down 2 percent from 1987. Soft hardwoods and hard hardwoods declined 7 percent and 9 percent, respectively. Hardwood residue increased 1 percent from last year's total of 98 thousand cords. Fewer than 500 cords of hardwood residue were imported from the Lake States and other areas. No softwoods were used for the fifth consecutive year in the Central States.

Industry Trends and Analysis

Average daily pulp production remained at 470 tons (table 6). No change in average daily production is anticipated.

Mills in adjacent States will remain the dominant markets for Central States pulpwood. Pulpwood imports will stay at a nominal level for the Central States mills.

Hardwood residue continues to be the dominant type of pulpwood procured from wood-using mills in the Central States.

Roundwood pulpwood production was 125 thousand cords for 1988—an 8-percent decline from 1987.

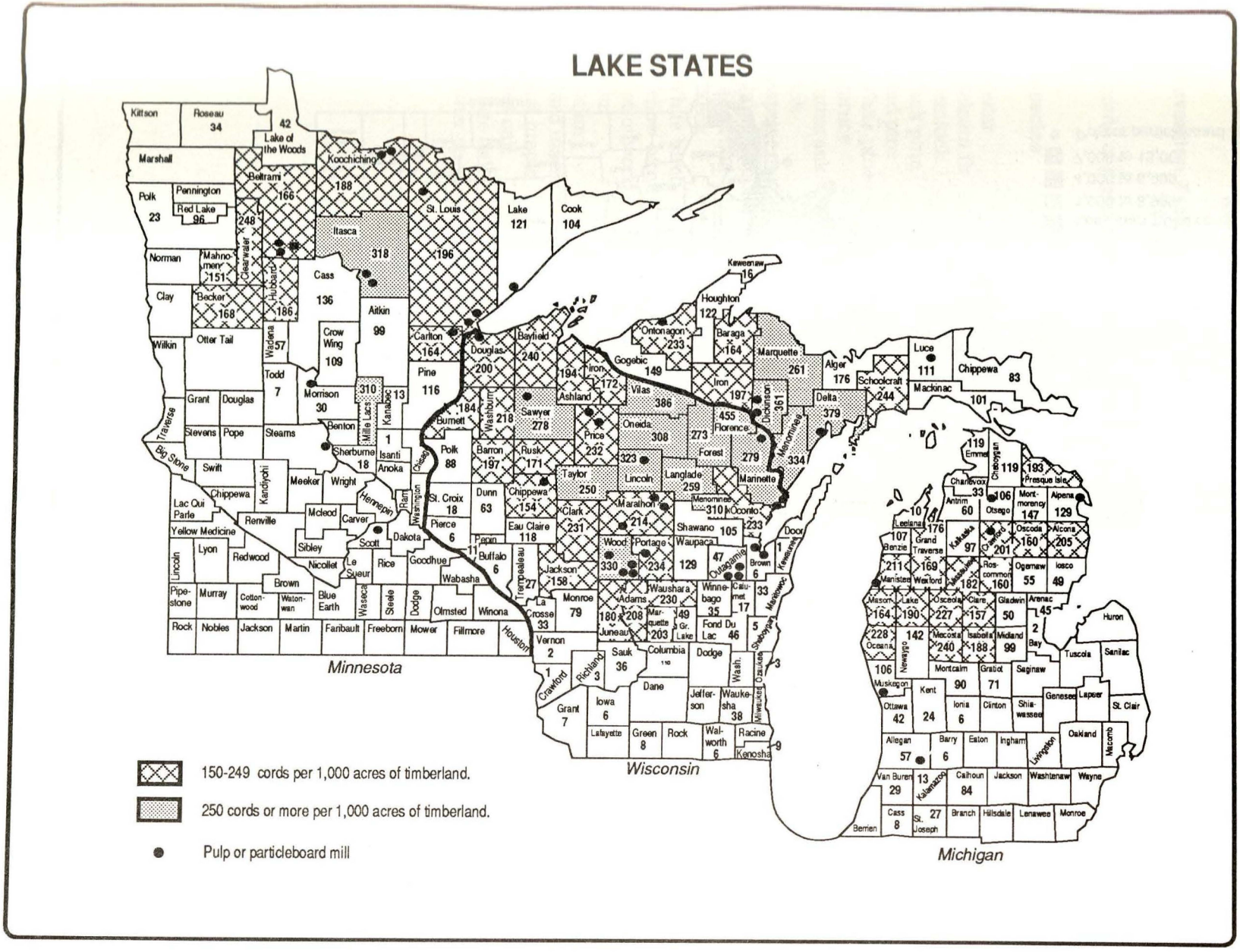


Figure 2.- -Cords of pulpwood cut per 1,000 acres of timberland in principal pulpwood-producing counties, 1988. Acres of timberland (stocking of trees greater than 16.7 percent) were determined during the last inventory in each State. Locations of active pulp and particleboard mills are shown.

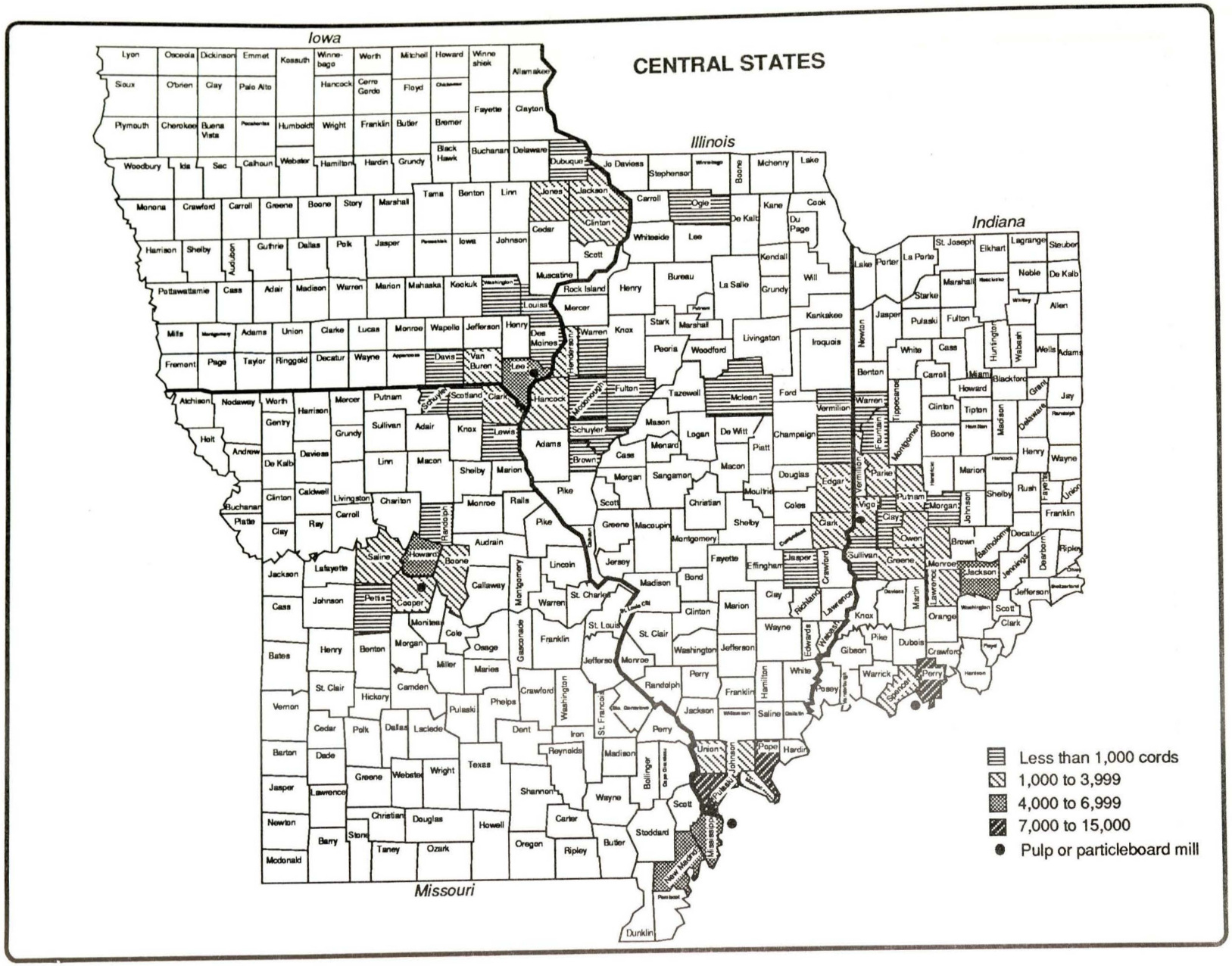


Figure 3.- -Production of pulpwood from roundwood (including chips from roundwood) in the Central States by counties, in standard cords, 1988. Locations of Central States and nearby pulp mills using Central States pulpwood are shown.

APPENDIX

Conversion Factors Used In The Lake States

Standard cords of green roundwood per green ton:

Species	Factor
Cedar	0.6329
Balsam fir	.4688
Hemlock	.4150
Jack pine	.4688
Red pine	.4688
White pine	.4777
Spruce	.5014
Tamarack	.4291
Ash	.4330
Aspen	.4291
Balsam poplar	.4083
Basswood	.5167
Beech	.3956
White birch	.4018
Yellow birch	.3723
Cottonwood	.4291
Elm	.4018
Hickory	.3701
Hard maple	.3617
Soft maple	.4083
Red oak	.3444
White oak	.3723
Other species	.4688

Table 2.--Pulpwood production by major species groups, Lake States, 1988

(In thousand cords, unpeeled)

Species group	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Roundwood				
Softwoods	1,767	580	448	739
Hardwoods				
Soft hardwoods [1]	4,810	1,581	1,569	1,660
Hard hardwoods [2]	908	513	–	395
Total	5,718	2,094	1,569	2,055
Total roundwood	7,485	2,674	2,017	2,794
Residue				
Softwoods	183	70	57	56
Hardwoods	467	176	57	234
Total	650	246	114	290
All material	8,135	2,920	2,131	3,084

[1]/Hardwood species with an average specific gravity of 0.50 or less.

[2]/Hardwood species with an average specific gravity of over 0.50.

Table 3.--Numbers of industrial plants in the Lake States using a particular species or residue for pulping and particleboard in 1988

Species and kind of material	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Aspen	43	11	14	18
Balsam fir	12	3	4	5
Birch	21	8	2	11
Hemlock	7	2	–	5
Pine	12	5	3	4
Spruce	14	2	6	6
Tamarack	6	1	2	3
Maple	20	9	1	10
Oak	17	8	1	8
Other hardwoods	25	9	7	9
Softwood residue	13	3	2	8
Hardwood residue	18	8	1	9
Total Plants 1/	48	11	15	22

[1]Some plants use more than one species, so numbers in column are not additive.

Table 4.- -Average daily production of active woodpulp mills in the Lake States by mill, location, and type of pulp produced, 1988

(In tons per 24 hours) 1/

Company	Location	All types	Type of pulp			
			Sulfite	Kraft	Groundwood and other mechanical	Semi-chemical
Michigan						
Abitibi-Price, Inc.	Alpena	400	--	--	400	--
Champion International	Quinnesec	825	--	825	--	--
Stone Container	Ontonagon	575	--	--	--	575
Mead Corp.	Escanaba	1,000	--	800	200	--
Menasha Corp.	Otsego	310	--	--	--	310
Packaging Corp. of America	Filer City	600	--	--	--	600
Warren Co., S.D.	Muskegon	250	--	250	--	--
Total	7 mills	3,960	--	1,875	600	1,485
Minnesota						
Blandin Paper Co.	Grand Rapids	300	--	--	300	--
Lake Superior Paper Industry	Duluth	440	--	--	440	--
Hennepin Paper Co.	Little Falls	75	--	--	75	--
International Bildrite Inc.	International Falls	110	--	--	110	--
Boise Cascade Corp.	International Falls	400	--	400	--	--
Potlatch Corp.	Cloquet	520	--	520	--	--
Superwood Corp.	Bemidji	100	--	--	100	--
Champion International	Sartell	385	--	--	385	--
Superwood Corp.	Duluth	350	--	--	350	--
Certain-Teed Corp.	Shakopee	80	--	--	80	--
Total	10 mills	2,760	--	920	1,840	--
Wisconsin						
James River Corp.	Green Bay	160	160	--	--	--
Weyerhaeuser Co.	Rothschild	200	200	--	--	--
Badger Paper Mills	Peshtigo	120	120	--	--	--
Appleton Papers, Inc.	Combined Locks	200	--	--	200	--
Consolidated Papers, Inc.	Stevens Point	270	--	--	270	--
Consolidated Papers, Inc.	Wisconsin Rapids	1,235	--	680	555	--
Green Bay Packaging, Inc.	Green Bay	220	--	--	--	220
Flambeau Paper Co.	Park Falls	120	120	--	--	--
Midtec Paper Corp.	Kimberly	180	--	--	180	--
Pentair, Inc.	Niagara	210	--	--	210	--
Mosinee Paper Mills Co.	Mosinee	220	--	220	--	--
Nekoosa Papers, Inc.	Nekoosa	335	--	335	--	--
Nekoosa Papers, Inc.	Port Edwards	235	235	--	--	--
Nekoosa Packaging, Inc.	Tomahawk	1,000	--	--	--	1,000
Globe Industries	Cornell	100	--	--	100	--
Superior Fiber Products Corp.	Superior	140	--	--	140	--
Thilmany Pulp and Paper Co.	Kaukauna	420	--	420	--	--
Wausau Paper Mills Co.	Brokaw	210	210	--	--	--
Superwood Corp.	Philips	100	--	--	100	--
Total	19 mills	5,675	1,045	1,655	1,755	1,220
All States	36 mills	12,395	1,045	4,450	4,195	2,705

1/Lockwood's Directory of the Paper and Allied Industries - - 1989.

Table 5.- -Production and imports of pulpwood, Central States, 1988

(In standard cords, unpeeled)1/

Species and destination	Production by States 2/					Imports			Total receipts
	Illinois	Indiana	Iowa	Missouri	Regional total	Lake States	Other U.S.	Total imports	
Softwoods									
Exported 3/	11,202	--	--	--	11,202	--	--	--	--
Total	11,202	--	--	--	11,202	--	--	--	--
Soft hardwoods 4/									
Central States 5/	4,916	10,637	12,408	11,409	39,370	--	--	--	39,370
Exported 3/	10,479	--	--	6,391	16,870	--	--	--	--
Total	15,395	10,637	12,408	17,800	56,240	--	--	--	39,370
Hard hardwoods 6/									
Central States 5/	6,461	10,453	3,239	1,971	22,124	--	--	--	22,124
Exported 3/	21,268	10,157	--	4,239	35,664	--	--	--	--
Total	27,729	20,610	3,239	6,210	57,788	--	--	--	22,124
Total roundwood									
Central States 5/	11,377	21,090	15,647	13,380	61,494	--	--	--	61,494
Exported 3/	42,949	10,157	--	10,630	63,736	--	--	--	--
Total	54,326	31,247	15,647	24,010	125,230	--	--	--	61,494
Residue, softwoods									
Exported 3/	38	--	--	3,811	3,849	--	--	--	--
Total	38	--	--	3,811	3,849	--	--	--	--
Residue, hardwoods									
Central States 5/	26,276	52,288	10,163	10,365	99,092	190	230	420	99,512
Exported 3/	11,776	95,370	--	63,195	170,341	--	--	--	--
Total	38,052	147,658	10,163	73,560	269,433	190	230	420	99,512
All wood material									
Central States 5/	37,653	73,378	25,810	23,745	160,586	190	230	420	161,006
Exported 3/	54,763	105,527	--	77,636	237,926	--	--	--	--
Total	92,416	178,905	25,810	101,381	398,512	190	230	420	161,006

1/ Factors used in converting to standard green cords (128 cu. ft. including bark and air space) were:
4,266 pounds of softwood roundwood;
4,795 pounds of soft hardwood roundwood;
5,394 pounds of hard hardwood roundwood;
4,100 pounds of softwood chips (green mill residue);
4,400 pounds of hardwood chips (green mill residue);
2,500 pounds of chips (all species, dry mill residue).

2/ Vertical columns of figures under box heading "Production by States" present the amount of pulpwood cut in each State.

3/ Pulpwood shipped to mills outside the region.

4/ Hardwood species with an average specific gravity of 0.50 or less.

5/ Combined to prevent disclosure of individual mill receipts.

6/ Hardwood species with an average specific gravity greater than 0.50.

Table 6.- -Average daily production of active woodpulp mills in the Central States by mill, location, and type of pulp produced, 1988

(In tons per 24 hours) 1/

Company	Location	All types	Type of pulp			
			Sulfite	Kraft	Groundwood and other mechanical	Semi-chemical
Illinois						
(No current operations)						
Total	0 mills	--	--	--	--	--
Indiana						
Weston Paper and Mfg. Co.	Terre Haute	270	--	--	--	270
Total	1 mill	270	--	--	--	270
Iowa						
Consolidated Packaging Corp	Fort Madison	140	--	--	--	140
Total	1 mill	140	--	--	--	140
Missouri						
Huebert Fibreboard, Inc.	Booneville	60	--	--	60	--
Total	1 mill	60	--	--	60	--
All States	3 mills	470	--	--	60	410

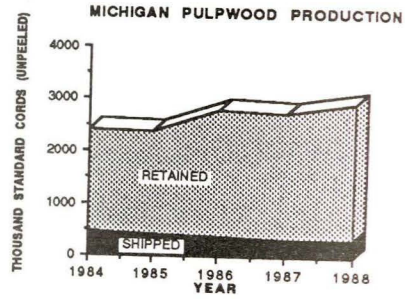
1/ Lockwood's Directory of the Paper and Allied Industries - - 1989

Table 7.- -Lake States pulpwood production by State of origin and destination, 1984-1988

(In thousand stand cords, unpeeled)1/

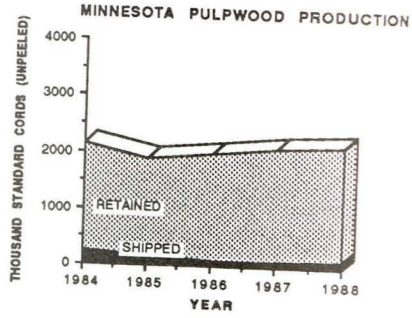
MICHIGAN

Year	Total production	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1984	2,398	--	442	1,934	22
1985	2,376	--	392	1,972	12
1986	2,808	--	369	2,429	10
1987	2,747	--	313	2,420	14
1988	2,920	2/	311	2,597	12
5-year average	2,650	2/	365	2,271	14



MINNESOTA

Year	Total production	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1984	2,150	1,888	184	--	78
1985	1,880	1,714	105	--	61
1986	1,979	1,872	69	1/	38
1987	2,079	1,967	61	--	51
1988	2,131	2,002	79	2	48
5-year average	2,044	1,889	100	1/	55



WISCONSIN

Year	Total production	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1984	2,644	65	2,534	45	--
1985	2,588	59	2,465	64	1/
1986	2,926	56	2,693	177	--
1987	2,869	62	2,644	161	2
1988	3,084	80	2,771	233	1/
5-year average	2,822	64	2622	136	1/

1/ Includes mill residues used for pulp.
2/ Less than 500 cords.

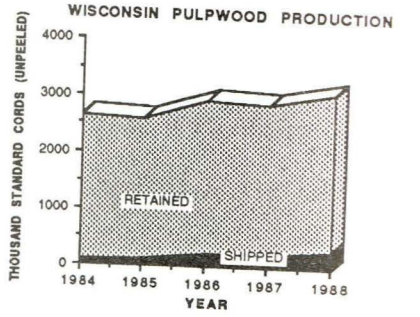


Table 8.--Lake States pulpwood production by Forest Survey Unit and destination by State, 1988

(In thousand standard cords, unpeeled)

Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other
MICHIGAN					
Roundwood					
Eastern. Upper Peninsula	758	672	--	76	10
Western Upper Peninsula	912	707	1/	204	1
Northern Lower Peninsula	946	945	--	--	1
Southern Lower Peninsula	58	58	--	--	--
Total	2,674	2,382	1/	280	12
Residue	246	215	--	31	--
Total pulpwood	2,920	2,597	1/	311	12
MINNESOTA					
Roundwood					
Aspen-Birch	922	1	840	49	32
Northern Pine	997	1	983	13	--
Central Hardwood	94	--	78	16	--
Prairie	4	--	4	--	--
Total	2,017	2	1,905	78	32
Residue	114	--	97	1	16
Total pulpwood	2,131	2	2,002	79	48
WISCONSIN					
Roundwood					
Northeast	1,112	200	1/	912	--
Northwest	1,078	19	71	988	--
Central	552	1/	--	552	--
Southwest	32	--	--	32	--
Southeast	20	2	--	18	--
Total	2,794	221	71	2,502	--
Residue	290	12	9	269	1/
Total pulpwood	3,084	233	80	2,771	1/

1/ Less than 500 cords.

Table 9.- -Lake States annual pulpwood production from roundwood by species, State, and Forest Survey Unit, 1984-1988

(In thousand standard cords, unpeeled)

Unit	All species1/					Pine					Spruce				
	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988
MICHIGAN															
Eastern Upper Peninsula	510	568	681	711	758	113	101	107	95	93	43	44	50	54	53
Western Upper Peninsula	635	631	866	777	911	73	67	66	58	82	33	40	40	41	39
Northern Lower Peninsula	1,004	953	1,013	978	946	105	146	142	139	123	1	(2/)	3	2	1
Southern Lower Peninsula	59	61	55	52	59	2	(2/)	(2/)	(2/)	(2/)	–	–	–	–	–
Total	2,208	2,213	2,615	2,518	2,674	293	314	315	292	298	77	84	93	97	93
MINNESOTA															
Aspen-Birch	940	782	828	969	922	100	71	74	64	72	90	83	74	82	114
Northern Pine	1,054	951	965	911	997	85	64	60	45	47	27	28	24	19	32
Central Hardwood	63	57	82	83	94	4	3	5	2	2	(2/)	(2/)	(2/)	(2/)	(2/)
Prairie	1	(2/)	1	1	4	(2/)	(2/)	–	–	–	–	–	–	–	–
Total	2,058	1,790	1,876	1,964	2,017	189	138	139	111	121	117	111	98	101	146
WISCONSIN															
Northeast	963	912	1,102	1,044	1,112	111	109	137	139	170	33	26	21	24	26
Northwest	962	954	1,017	977	1,078	150	123	105	80	114	8	10	9	11	15
Central	377	385	484	513	552	182	182	233	239	250	1	1	1	1	2
Southwest	28	29	17	26	32	27	27	16	23	28	(2/)	(2/)	(2/)	(2/)	(2/)
Southeast	18	15	15	12	20	13	10	9	7	12	–	(2/)	(2/)	(2/)	(2/)
Total	2,348	2,295	2,635	2,572	2,794	483	451	500	488	574	42	37	31	36	43
Total Lake States	6,614	6,298	7,126	7,054	7,485	965	903	954	891	993	236	232	222	234	282

1/Includes a small quantity of cedar not shown elsewhere in the table.

2/Less than 500 cords.

(Table 9 continued)

Unit	Balsam fir					Hemlock					Tamarack				
	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988
MICHIGAN															
Eastern Upper Peninsula	44	49	49	57	75	25	19	24	20	20	5	2	2	2	3
Western Upper Peninsula	31	42	44	38	39	22	18	19	19	15	5	2	2	20	2
Northern Lower Peninsula	3	2	4	3	4	–	–	(2/)	–	(2/)	–	–	–	–	–
Southern Lower Peninsula	–	–	–	–	–	–	–	(2/)	–	–	–	–	–	–	–
Total	78	93	97	98	118	47	37	43	39	35	10	4	4	22	5
MINNESOTA															
Aspen-Birch	88	69	51	61	102	–	–	–	–	–	6	7	13	5	9
Northern Pine	58	53	50	50	68	–	–	–	–	–	5	2	(2/)	3	2
Central Hardwood	–	(2/)	–	1	1	–	–	–	–	–	(2/)	–	–	–	–
Prairie	–	–	–	–	–	–	–	–	–	–	(2/)	–	–	–	–
Total	146	122	101	112	171	–	–	–	–	–	11	9	13	8	11
WISCONSIN															
Northeast	60	59	36	32	39	21	32	31	40	40	2	1	1	1	1
Northwest	20	12	9	12	31	3	3	5	1	4	2	(2/)	1	1	2
Central	1	–	1	1	1	1	1	1	1	2	(2/)	(2/)	(2/)	(2/)	1
Southwest	–	1	–	(2/)	(2/)	–	(2/)	–	–	(2/)	–	–	–	–	–
Southeast	–	–	(2/)	–	(2/)	–	(2/)	(2/)	–	(2/)	–	–	–	–	–
Total	81	72	46	45	71	25	36	37	42	46	4	1	2	2	4
Total Lake States	305	287	244	255	360	72	73	80	81	81	25	14	19	32	20

(Table 9 continued on next page)

2/Less than 500 cords.

(Table 9 continued)

Unit	Aspen					Birch					Other hardwoods				
	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988
MICHIGAN															
Eastern Upper Peninsula	117	144	113	114	135	40	41	78	87	106	114	134	225	251	253
Western Upper Peninsula	212	244	252	180	293	54	48	112	106	115	200	154	313	300	316
Northern Lower Peninsula	620	576	599	593	562	26	20	30	35	38	251	209	235	206	218
Southern Lower Peninsula	13	13	15	10	19	(2/)	(2/)	(2/)	(2/)	(2/)	43	48	40	42	40
Total	962	977	979	897	1,009	120	109	220	228	259	608	545	813	799	827
MINNESOTA															
Aspen-Birch	619	524	575	716	581	2	1	10	12	10	35	27	31	29	34
Northern Pine	853	787	820	784	830	1	1	(2/)	1	2	24	18	11	9	16
Central Hardwood	56	50	73	77	86	(2/)	(2/)	(2/)	(2/)	1	3	3	4	3	4
Prairie	1	–	1	1	4	–	–	–	–	–	–	–	–	–	–
Total	1,529	1,361	1,469	1,578	1,501	3	2	10	13	13	62	48	46	41	54
WISCONSIN															
Northeast	435	396	474	369	418	90	82	144	145	151	209	205	258	294	267
Northwest	522	556	567	572	573	105	98	126	122	139	154	153	195	178	200
Central	107	117	162	153	176	13	13	13	19	23	73	71	73	99	97
Southwest	(2/)	1	1	2	3	(2/)	(2/)	(2/)	(2/)	(2/)	1	1	(2/)	1	1
Southeast	2	3	4	1	1	(2/)	(2/)	(2/)	1	1	2	1	2	3	6
Total	1,066	1,073	1,208	1,097	1,171	208	193	283	287	314	439	431	528	575	571
Total Lake States	3,557	3,411	3,656	3,572	3,681	331	304	513	528	586	1,109	1,024	1,387	1,415	1,452

2/Less than 500 cords.

Table 10.- -Michigan pulpwood production from roundwood by county and species group, 1988

(In standard cords, unpeeled)

Unit and county1/	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
E. UPPER PENINSULA												
Alger	84,966	1,764	6,188	5,339	6,947	131	666	3,753	239	730	5,629	2,192
Chippewa	58,216	1,887	6,618	1,902	7,277	140	712	4,599	256	129	12,263	1,418
Delta	217,401	6,213	21,960	4,564	28,582	1,118	2,345	19,019	842	1,326	38,559	6,876
Luce	51,460	1,683	5,839	1,103	14,372	554	635	4,245	228	123	4,347	647
Mackinac	52,440	1,498	8,979	1,052	2,389	134	565	5,713	203	218	13,478	1,880
Menominee	164,127	3,411	13,944	3,151	6,947	636	1,303	8,529	603	1,034	50,559	4,068
Schoolcraft	129,315	3,521	11,272	3,097	14,535	1,637	1,383	7,299	451	500	9,994	2,894
Total	757,925	19,977	74,800	20,208	81,049	4,350	7,609	53,157	2,822	4,060	134,829	19,975
W. UPPER PENINSULA												
Baraga	83,424	478	1,491	1,400	9,987	48	189	939	61	1,554	11,275	5
Dickinson	134,915	4,070	14,723	3,901	7,830	2,512	1,551	11,467	639	592	44,227	1,938
Gogebic	91,898	26	460	419	2,059	1,223	528	3,101	17	1,592	17,696	80
Houghton	62,107	1,022	3,630	1,367	6,098	562	696	2,599	205	1,058	9,175	134
Iron	128,324	854	4,524	1,090	4,889	2,342	975	9,489	534	1,462	52,083	328
Keweenaw	3,386	--	16	--	166	78	103	9	--	101	554	--
Marquette	252,070	4,031	13,950	6,125	29,523	494	1,561	10,634	666	1,637	72,831	4,335
Ontonagon	155,584	--	393	218	7,497	495	517	227	11	4,593	85,553	1,625
Total	911,708	10,481	39,187	14,520	68,049	7,754	6,120	38,465	2,133	12,589	293,394	8,445
N. LOWER PENINSULA												
Alcona	62,436	--	36	--	9,490	43	--	--	--	734	37,457	1,446
Alpena	27,041	--	77	--	648	97	--	47	--	364	19,404	698
Antrim	9,294	--	--	--	--	434	--	--	--	--	5,023	--
Arenac	4,153	--	--	--	17	9	--	--	--	4	3,599	73
Bay	32	--	--	--	--	--	--	--	--	--	32	--
Benzie	12,941	--	--	--	112	40	--	--	--	166	7,502	104
Charlevoix	4,507	--	--	--	203	70	31	--	--	100	1,095	--
Cheboygan	43,455	146	1,428	17	3,505	953	24	264	--	347	25,430	342
Clare	33,822	--	--	--	236	37	--	--	--	264	26,868	--
Crawford	54,891	--	23	--	23,091	1,079	--	6	--	4	19,915	--
Emmet	23,229	63	456	128	2,692	1,159	362	223	--	154	12,468	214
Gladwin	9,532	--	--	--	39	10	--	--	--	46	8,168	--
Grand Traverse	26,734	--	--	--	4,959	2,303	--	--	--	95	15,641	--
Iosco	11,020	--	--	--	354	53	--	--	--	282	7,255	127
Isabella	14,079	--	--	--	0	29	--	--	--	122	13,115	--
Kalkaska	23,857	--	--	--	6,166	1,694	--	--	--	40	11,028	--
Lake	56,978	--	--	--	4,245	406	--	--	--	489	28,388	--
Leelanau	766	--	--	--	0	0	--	--	--	--	36	--
Manistee	45,766	--	--	--	37	193	--	--	--	211	26,095	260
Mason	23,873	--	--	--	0	150	--	--	--	183	15,525	--
Mecosta	28,855	--	--	--	40	338	--	--	--	77	27,781	--
Midland	14,712	--	--	--	0	0	--	--	--	161	12,749	78
Missaukee	37,071	--	--	--	2,173	2,934	--	--	--	305	23,395	--
Montmorency	42,671	--	--	--	2,461	95	--	--	--	394	25,763	338
Newaygo	44,151	--	--	--	209	87	--	--	--	353	22,588	--
Oceana	32,825	--	--	--	0	24	--	--	--	420	21,533	--
Ogemaw	11,944	--	20	--	1,375	11	--	--	--	66	7,936	102
Osceola	35,713	--	--	--	135	511	--	--	--	275	29,309	--
Oscoda	49,103	--	682	--	11,255	717	--	5	--	300	22,168	332
Otsego	27,722	--	--	--	8,943	955	--	--	--	253	11,015	--
Presque Isle	51,533	124	1,772	--	6,547	115	--	647	--	674	28,336	818
Roscommon	39,437	--	--	--	12,469	253	--	--	--	25	24,085	75
Wexford	41,860	--	--	--	586	5,694	--	--	--	466	21,712	--
Total	946,003	333	4,494	145	101,987	20,493	417	1,192	--	7,374	562,414	5,007
S. LOWER PENINSULA												
Allegan	7,841	--	--	--	--	--	--	--	--	187	867	--
Barry	672	--	--	--	--	--	--	--	--	10	73	--
Calhoun	6,403	--	--	--	--	--	--	--	--	247	754	--
Cass	428	--	--	--	--	--	--	--	--	16	2	--
Gratiot	1,929	--	--	--	--	--	--	--	--	54	1,571	--
Ingham	20	--	--	--	--	--	--	--	--	0	20	--
Ionia	221	--	--	--	--	--	--	--	--	6	97	--
Kalamazoo	865	--	--	--	--	--	--	--	--	58	112	--
Kent	2,972	--	--	--	--	--	--	--	--	145	821	--
Montcalm	12,739	--	--	--	--	--	--	--	--	435	7,209	--
Muskegon	16,799	--	--	--	--	49	--	--	--	246	6,335	--
Ottawa	3,261	--	--	--	--	--	--	--	--	98	275	--
St.Joseph	1,584	--	--	--	--	--	--	--	--	109	209	--
Van Buren	3,007	--	--	--	--	--	--	--	--	172	126	--
Total	58,741	--	--	--	--	49	--	--	--	1,783	18,471	--
State total	2,674,374	30,791	118,481	34,873	251,085	32,646	14,146	92,814	4,955	25,806	1,009,106	33,427

1/ Includes only those counties that supplied pulpwood in 1988.

(Table 10 continued on next page)

(Table 10 continued)

MICHIGAN

Unit and county1/	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
E. UPPER PENINSULA												
Alger	2,491	6,166	4,404	5,777	--	1,446	--	19,250	9,316	1,385	--	1,153
Chippewa	728	2,406	6,820	1,585	--	547	--	4,343	4,305	133	--	148
Delta	5,988	5,439	20,098	9,297	--	3,950	--	20,897	16,367	2,217	--	1,744
Luce	416	3,706	2,097	1,791	--	320	--	6,787	2,284	100	--	183
Mackinac	1,244	1,461	4,501	1,815	--	944	--	2,883	3,022	213	--	248
Menominee	3,676	3,386	25,551	6,017	--	2,500	--	15,067	10,856	1,493	--	1,396
Schoolcraft	2,409	9,232	8,641	7,521	--	1,617	--	24,751	17,069	822	--	670
Total	16,952	31,796	72,112	33,803	--	11,324	--	93,978	63,219	6,363	--	5,542
W. UPPER PENINSULA												
Baraga	2,139	1,313	6,276	5,792	--	797	--	23,751	10,793	2,465	--	2,671
Dickinson	2,369	75	14,427	3,798	--	1,353	--	10,376	6,945	1,258	--	864
Gogebic	4,160	337	4,086	7,083	--	1,314	--	27,660	13,999	3,775	8	2,275
Houghton	1,588	623	4,879	3,519	--	677	--	14,485	6,864	1,498	--	1,428
Iron	1,800	711	13,419	4,317	--	728	--	17,075	8,299	1,701	2	1,702
Keweenaw	--	145	13	266	--	1	--	1,230	437	73	1	193
Marquette	6,090	3,640	28,444	10,146	--	3,265	--	29,555	18,916	3,716	--	2,511
Ontonagon	6,096	206	5,240	4,063	--	2,282	--	24,521	8,407	2,805	6	829
Total	24,242	7,050	76,784	38,984	--	10,417	--	148,653	74,660	17,291	17	12,473
N. LOWER PENINSULA												
Alcona	106	115	4,241	1	--	--	--	286	3,496	4,647	338	--
Alpena	63	53	2,547	--	--	--	--	92	1,868	975	108	--
Antrim	26	26	--	--	--	--	--	1,556	2,229	--	--	--
Arenac	--	--	16	--	--	--	--	--	413	20	2	--
Bay	--	--	--	--	--	--	--	--	--	--	--	--
Benzie	258	262	339	224	--	--	--	954	1,724	631	417	208
Charlevoix	1,493	65	146	45	--	--	--	991	245	23	--	--
Cheboygan	34	21	3,512	--	--	--	--	95	6,247	1,090	--	--
Clare	--	120	569	--	--	--	--	101	2,212	2,318	1,097	--
Crawford	8	25	712	--	--	--	--	2,892	2,226	4,600	310	--
Emmet	--	--	597	--	--	--	--	327	4,386	--	--	--
Gladwin	--	--	287	1	--	--	--	--	457	292	232	--
Grand Traverse	213	214	314	57	--	--	--	555	830	679	666	208
Iosco	25	28	1,244	2	--	--	--	86	1,173	278	113	--
Isabella	--	10	82	--	--	--	--	15	330	247	129	--
Kalkaska	389	86	395	48	--	--	--	962	1,975	556	336	182
Lake	208	305	713	225	--	216	--	964	6,044	8,212	6,459	104
Leelanau	104	--	--	--	--	--	--	313	313	--	--	--
Manistee	521	562	1,913	210	--	--	--	3,110	5,546	3,594	3,306	208
Mason	104	113	697	10	--	216	--	444	3,000	1,514	1,813	104
Mecosta	--	2	216	7	--	--	--	62	218	69	45	--
Midland	104	30	307	4	25	--	--	2	749	237	266	--
Missaukee	208	41	579	3	--	--	--	554	4,327	1,430	1,122	--
Montmorency	1,110	417	3,908	--	--	--	--	1,807	4,175	2,169	34	--
Newaygo	--	91	209	40	--	217	53	554	6,505	6,378	6,826	41
Oceana	--	124	189	73	735	--	--	459	3,208	3,004	3,056	--
Ogemaw	33	9	1,725	1	--	--	--	27	523	107	9	--
Osceola	--	140	731	68	--	--	--	708	2,081	528	1,177	50
Oscoda	36	27	2,149	--	--	--	--	297	4,494	6,302	339	--
Otsego	--	236	54	2	--	--	--	1,855	3,944	464	1	--
Presque Isle	103	101	5,790	--	--	--	--	235	4,749	1,370	152	--
Roscommon	--	2	701	2	--	--	--	4	901	660	260	--
Wexford	312	488	1,143	261	--	--	--	1,689	4,289	2,183	2,516	521
Total	5,458	3,713	36,025	1,284	760	649	53	21,996	84,877	54,577	31,129	1,626
S. LOWER PENINSULA												
Allegan	--	--	--	--	184	433	157	62	1,617	2,301	2,033	--
Barry	--	2	--	--	--	432	9	25	34	66	21	--
Calhoun	--	1	--	--	--	649	313	32	2,627	653	1,127	--
Cass	--	--	--	--	--	344	6	4	37	11	8	--
Gratiot	--	--	--	--	--	--	--	17	114	107	66	--
Ingham	--	--	--	--	--	--	--	--	--	--	--	--
Ionia	--	--	--	--	--	90	--	3	9	13	3	--
Kalamazoo	--	--	--	--	--	216	104	--	190	160	25	--
Kent	--	17	--	5	--	321	1	182	492	696	292	--
Montcalm	--	53	75	--	--	1,081	52	71	937	1,091	1,735	--
Muskegon	--	166	18	14	--	216	--	66	2,283	4,667	2,739	--
Ottawa	--	30	--	4	368	216	--	138	1,112	679	341	--
St. Joseph	--	--	--	--	--	216	366	31	249	336	68	--
Van Buren	--	--	--	--	184	649	209	155	636	452	424	--
Total	--	269	93	23	736	4,863	1,217	786	10,337	11,232	8,882	--
State total	46,652	42,828	185,013	74,094	1,496	27,253	1,270	265,413	233,093	89,463	40,028	19,641

1/ Includes only those counties that supplied pulpwood in 1988.

Table 11.- -Minnesota pulpwood production from roundwood by county and species group, 1988

(In standard cords, unpeeled)

Unit and county 1	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
ASPEN-BIRCH												
Carlton	50,679	--	13,643	--	793	742	13	5,753	110	84	25,488	2,257
Cook	55,793	--	7,633	--	2,326	--	--	18,677	--	764	26,033	252
Koochiching	237,370	--	18,732	--	19,975	5,745	293	38,390	7,913	--	140,599	5,508
Lake	102,077	--	9,802	--	1,777	1,005	544	14,603	387	126	65,215	2,714
St. Louis	475,713	--	51,756	--	28,482	9,118	833	36,567	406	744	323,827	18,570
Total	921,632	--	101,566	--	53,353	16,610	1,683	113,990	8,816	1,718	581,162	29,301
NORTHERN PINE												
Aitkin	66,511	--	3,647	--	315	257	5	1,646	--	253	53,638	6,364
Becker	52,896	--	180	--	299	90	4	24	--	--	52,054	245
Beltrami	129,198	--	10,834	--	5,200	1,552	63	4,143	555	--	106,606	245
Cass	116,362	--	6,376	--	3,564	992	25	2,040	--	--	102,797	568
Clearwater	74,301	--	2,016	--	1,118	376	13	944	--	--	69,671	163
Crow Wing	40,397	--	--	--	3,338	471	--	24	--	--	36,347	217
Hubbard	74,182	--	457	--	3,020	895	39	537	--	--	68,989	245
Itasca	400,181	--	44,406	--	6,197	2,907	182	20,649	201	338	315,800	4,856
Lake of the Woods	14,428	--	71	--	9,057	648	--	1,284	1,141	--	2,227	--
Mahnomen	16,057	--	--	--	--	--	--	--	--	--	15,975	82
Roseau	6,353	--	--	--	6,155	--	--	187	--	--	11	--
Wadena	6,120	--	70	--	518	135	1	18	--	--	5,359	19
Total	996,986	--	68,057	--	38,781	8,323	332	31,496	1,897	591	829,474	13,004
CENTRAL HARDWOOD												
Isanti	24	--	24	--	--	--	--	--	--	--	--	--
Kanabec	1,659	--	--	--	--	--	--	--	--	--	1,659	--
Mille Lacs	37,496	--	152	--	42	23	--	69	--	--	37,179	31
Morrison	4,436	--	--	--	42	10	--	--	--	--	4,378	6
Pine	48,805	--	714	--	410	370	8	126	--	84	42,088	3,762
Sherburne	1,053	--	--	--	--	1,015	38	--	--	--	--	--
Todd	703	--	--	--	42	10	--	--	--	--	645	6
Total	94,176	--	890	--	536	1,428	46	195	--	84	85,949	3,805
PRAIRIE												
Polk	1,542	--	--	--	--	--	--	--	--	--	1,542	--
Red Lake	2,604	--	--	--	--	--	--	--	--	--	2,604	--
Total	4,146	--	--	--	--	--	--	--	--	--	4,146	--
State total	2,016,940	--	170,513	--	92,670	26,361	2,061	145,681	10,713	2,393	1,500,731	46,110

1. Includes only those counties that supplied pulpwood in 1988.

(Table 11 continued on next page)

(Table 11 continued)

MINNESOTA

Unit and county 1/	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
ASPEN-BIRCH												
Carlton	--	--	1,716	--	--	--	--	--	80	--	--	--
Cook	--	--	108	--	--	--	--	--	--	--	--	--
Koochiching	--	--	215	--	--	--	--	--	--	--	--	--
Lake	--	--	5,784	--	--	--	--	--	120	--	--	--
St. Louis	--	--	2,589	--	--	--	--	--	2,821	--	--	--
Total	--	--	10,412	-	--	--	--	--	3,021	--	--	--
NORTH PINE												
Aitkin	--	--	147	--	--	--	--	--	239	--	--	--
Becker	--	--	--	--	--	--	--	--	--	--	--	--
Beltrami	--	--	--	--	--	--	--	--	--	--	--	--
Cass	--	--	--	--	--	--	--	--	--	--	--	--
Clearwater	--	--	--	--	--	--	--	--	--	--	--	--
Crow Wing	--	--	--	--	--	--	--	--	--	--	--	--
Hubbard	--	--	--	--	--	--	--	--	--	--	--	--
Itasca	--	--	1,626	--	--	--	--	--	3,019	--	--	--
Lake of the Woods	--	--	--	--	--	--	--	--	--	--	--	--
Mahnomen	--	--	--	--	--	--	--	--	--	--	--	--
Roseau	--	--	--	--	--	--	--	--	--	--	--	--
Wadena	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	1,773	--	--	--	--	--	3,258	--	--	--
CENTRAL HARDWOOD												
Isanti	--	--	--	--	--	--	--	--	--	--	--	--
Kanabec	--	--	--	--	--	--	--	--	--	--	--	--
Mille Lacs	--	--	--	--	--	--	--	--	--	--	--	--
Morrison	--	--	--	--	--	--	--	--	--	--	--	--
Pine	--	--	1,163	--	--	--	--	--	80	--	--	--
Sherburne	--	--	--	--	--	--	--	--	--	--	--	--
Todd	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	1,163	--	--	--	--	--	80	--	--	--
PRAIRIE												
Polk	--	--	--	--	--	--	--	--	--	--	--	--
Red Lake	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
State total	--	--	13,348	--	--	--	--	--	6,359	--	--	--

1/Includes only those counties that supplied pulpwood in 1988.

Table 12.- -Wisconsin pulpwood production from roundwood by county and species group, 1988

(In standard cords, unpeeled)

Unit and county1/	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
NORTHEAST												
Florence	109,167	--	6,662	3,170	10,761	3,793	635	5,880	308	1,335	40,839	--
Forest	134,820	--	9,178	2,228	2,550	12,451	606	7,466	183	4,404	41,590	--
Langlade	96,889	--	1,738	279	4,100	3,975	157	560	104	3,191	37,178	--
Lincoln	126,469	--	3,210	5,082	4,458	3,308	609	1,457	334	4,000	70,271	--
Marinette	178,214	--	5,728	675	26,649	10,584	416	2,963	334	1,448	75,059	--
Menominee	65,412	--	244	25,582	1,852	3,656	742	30	--	872	9,238	--
Oconto	79,523	--	627	175	7,213	12,905	239	97	--	665	27,299	--
Oneida	151,981	--	8,122	1,349	17,692	11,136	1,743	6,022	388	3,372	44,648	--
Shawano	26,468	--	148	1,004	378	2,653	91	46	--	553	8,912	--
Vilas	143,261	--	2,815	627	14,130	7,122	3,436	1,626	6	1,303	62,874	--
Total	1,112,204	--	38,472	40,171	89,783	71,583	8,674	26,147	1,657	21,143	417,908	--
NORTHWEST												
Ashland	97,730	--	4,957	201	4,831	4,344	201	5,902	361	2,771	42,248	--
Barron	30,741	--	--	--	207	290	--	--	--	322	23,638	--
Bayfield	177,023	--	3,429	66	16,718	6,383	657	190	--	2,011	103,854	1,552
Burnett	56,903	--	169	--	21,774	3,075	39	248	--	274	27,702	--
Douglas	123,374	--	12,112	46	16,167	8,136	44	1,285	--	3,330	63,683	752
Iron	64,870	--	477	163	228	770	192	176	--	747	37,736	--
Polk	19,426	--	24	--	66	21	--	--	--	89	17,592	--
Price	124,554	--	4,371	1,312	4,027	3,421	143	2,314	750	6,593	50,031	--
Rusk	61,481	--	65	55	29	1,991	--	69	132	2,878	37,630	--
Sawyer	164,672	--	2,013	307	2,137	3,114	57	3,392	163	6,764	86,592	--
Taylor	86,020	--	3,379	1,446	10	5,707	53	1,248	285	4,263	38,365	--
Washburn	71,194	--	343	--	6,821	2,097	207	228	376	2,086	44,510	--
Total	1,077,988	--	31,339	3,596	73,015	39,349	1,593	15,052	2,067	32,128	573,581	2,304
CENTRAL												
Adams	47,767	--	13	--	17,932	23,187	1,396	--	--	35	1,511	--
Chippewa	33,668	--	179	177	2,236	1,338	--	285	242	1,418	16,947	--
Clark	72,549	--	14	27	6,252	3,253	--	11	--	2,402	41,295	--
Eau Claire	18,201	--	--	14	4,727	3,603	416	--	--	57	6,561	--
Jackson	58,648	--	--	--	25,161	8,033	916	78	130	52	12,111	--
Juneau	45,329	--	--	--	23,597	12,875	722	--	--	162	669	--
Marathon	75,307	--	460	1,460	970	3,135	854	739	51	2,018	44,812	--
Marquette	18,679	--	11	--	1,958	10,919	767	33	--	77	277	--
Monroe	18,846	--	--	--	8,329	5,231	731	35	77	188	1,343	--
Portage	40,239	--	166	286	10,692	11,694	1,518	399	59	494	6,036	--
Waupaca	22,396	--	32	145	409	9,926	912	--	25	384	6,863	--
Waushara	32,856	--	--	--	4,115	23,370	2,975	38	--	73	868	--
Wood	67,952	--	14	78	9,618	4,657	1,526	96	34	244	37,032	--
Total	552,437	--	889	2,187	115,996	121,221	12,733	1,714	618	7,604	176,325	--
SOUTHWEST												
Buffalo	1,181	--	--	--	223	884	63	--	--	1	--	--
Crawford	105	--	--	--	--	105	--	--	--	--	--	--
Dunn	10,773	--	25	13	3,135	5,238	126	--	--	40	1,376	--
Grant	1,281	--	--	10	145	1,039	17	--	--	3	--	--
Iowa	753	--	--	--	--	505	248	--	--	--	--	--
Lacrosse	3,974	--	--	--	1,661	2,058	151	71	--	--	--	--
Lafayette	18	--	18	--	--	--	--	--	--	--	--	--
Pepin	588	--	--	--	43	531	14	--	--	--	--	--
Pierce	535	--	16	--	--	11	--	--	--	1	497	--
Richland	507	--	--	--	27	391	89	--	--	--	--	--
St.croix	1,145	--	--	--	60	580	--	--	--	--	505	--
Sauk	6,378	--	14	--	228	5,954	141	28	--	1	--	--
Trempealeau	3,951	--	--	--	157	3,389	361	--	--	--	--	--
Vernon	424	--	--	--	--	276	73	75	--	--	--	--
Total	31,613	--	73	23	5,679	20,961	1,283	174	--	46	2,378	--
SOUTHEAST												
Brown	295	--	--	--	19	62	--	--	--	--	202	--
Calumet	422	--	--	--	--	--	--	--	--	21	--	--
Columbia	9,254	--	--	--	110	6,334	479	--	--	104	40	--
Dodge	14	--	--	14	--	--	--	--	--	--	--	--
Fond Du Lac	1,574	--	--	--	--	1,033	276	60	--	10	--	--
Green	262	--	--	--	192	23	--	--	--	8	--	--
Green Lake	1,037	--	--	--	92	674	232	--	--	2	--	--
Kenosha	100	--	26	25	--	49	--	--	--	--	--	--
Kewaunee	27	--	--	--	--	--	--	--	--	--	--	--
Manitowoc	1,822	--	--	13	13	629	--	--	--	51	126	--
Outagamie	3,176	--	--	--	--	296	10	--	--	64	676	--
Ozaukee	52	--	--	--	--	52	--	--	--	--	--	--
Rock	11	--	--	--	--	11	--	--	--	--	--	--
Sheboygan	246	--	--	--	--	124	--	24	--	5	--	--
Walworth	219	--	--	--	--	219	--	--	--	--	--	--
Waukesha	1,203	--	--	--	--	1,036	167	--	--	--	--	--
Winnebago	495	--	--	--	14	465	16	--	--	--	--	--
Total	20,209	--	26	52	440	11,007	1,180	84	--	265	1,044	--
State total	2,794,451	--	70,799	46,029	284,913	264,121	25,463	43,171	4,342	61,186	1,171,236	2,304

1/Includes only those counties that supplied pulpwood in 1983.

(Table 12 continued on next page)

(Table 12 continued)

WISCONSIN

Unit and county 1/	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
NORTHEAST												
Florence	1,584	103	10,444	2,559	--	1,034	--	11,696	6,426	1,211	--	727
Forest	2,344	269	14,124	2,883	--	4,653	5	19,212	9,456	504	7	707
Langlade	1,948	210	10,528	2,469	--	1,171	9	18,936	7,752	1,130	15	1,439
Lincoln	1,346	6	8,230	1,024	--	1,785	--	10,381	8,399	1,865	--	704
Marinette	1,550	436	21,978	3,456	--	963	--	15,166	7,919	1,605	1	1,284
Menominee	327	833	2,036	1,932	--	1,800	--	9,262	5,201	813	7	985
Oconto	1,071	112	11,040	1,993	--	1,327	--	8,277	4,788	1,079	--	616
Oneida	1,488	11	28,517	1,862	--	1,141	8	11,279	9,512	3,211	12	468
Shawano	230	176	1,711	555	--	1,013	--	4,640	3,759	352	--	247
Vilas	2,061	106	21,397	2,395	--	956	5	13,585	6,160	1,989	89	579
Total	13,949	2,262	130,005	21,128	--	15,843	27	122,434	69,372	13,759	131	7,756
NORTHWEST												
Ashland	772	1	9,760	1,559	--	1,243	4	10,450	5,268	1,723	882	252
Barron	47	--	4,109	--	--	2	--	179	251	1,061	601	34
Bayfield	388	--	28,111	501	--	325	--	4,851	4,892	3,077	18	--
Burnett	--	--	2,241	--	--	3	--	311	394	572	82	19
Douglas	--	--	12,207	64	--	73	--	396	3,915	1,163	1	0
Iron	1,317	79	10,404	1,623	--	304	7	6,360	3,100	727	7	453
Polk	1	--	948	--	--	0	--	44	103	382	140	16
Price	1,887	4	16,295	2,122	--	1,925	5	14,233	12,897	1,661	17	546
Rusk	649	--	6,145	400	--	597	--	4,722	3,326	2,209	350	234
Sawyer	2,051	--	24,207	3,157	--	1,507	--	14,622	9,442	4,543	500	104
Taylor	1,128	7	6,441	1,142	--	1,669	8	8,131	11,963	688	7	80
Washburn	55	--	6,907	100	--	186	--	1,532	2,441	2,535	638	132
Total	8,295	91	127,775	10,668	--	7,834	24	65,831	57,992	20,341	3,243	1,870
CENTRAL												
Adams	6	--	70	--	--	10	--	31	109	3,043	406	18
Chippewa	162	--	3,881	581	--	400	--	2,248	1,920	1,209	404	41
Clark	53	6	5,213	592	--	1,569	2	2,815	5,668	1,933	1,172	272
Eau Claire	32	--	805	--	--	87	--	151	641	827	223	57
Jackson	--	--	1,999	82	--	117	--	583	3,674	4,157	1,320	235
Juneau	--	--	735	--	--	166	--	777	695	3,209	1,686	36
Marathon	259	110	1,845	1,355	--	3,914	--	5,903	5,480	1,425	308	209
Marquette	--	2	617	4	--	70	--	657	363	1,668	1,250	6
Monroe	--	--	747	--	--	113	--	306	628	716	289	113
Portage	8	16	1,220	198	--	25	--	1,413	960	3,041	1,960	54
Waupaca	59	19	355	73	--	312	--	993	1,247	462	126	54
Waushara	--	23	128	42	--	94	--	464	329	200	104	33
Wood	9	7	2,345	285	--	281	--	2,524	3,690	3,744	1,713	55
Total	588	183	19,960	3,212	--	7,158	2	18,865	25,404	25,634	10,961	1,183
SOUTHWEST												
Buffalo	--	--	5	--	--	1	--	--	1	--	--	3
Crawford	--	--	--	--	--	--	--	--	--	--	--	--
Dunn	14	--	241	31	--	15	--	186	125	124	74	10
Grant	--	--	--	--	--	9	--	8	7	43	--	--
Iowa	--	--	--	--	--	--	--	--	--	--	--	--
Lacrosse	--	--	--	--	--	--	--	--	--	26	7	--
Lafayette	--	--	--	--	--	--	--	--	--	--	--	--
Pepin	--	--	--	--	--	--	--	--	--	--	--	--
Pierce	--	--	1	--	--	1	--	7	--	--	--	1
Richland	--	--	--	--	--	--	--	--	--	--	--	--
St.croix	--	--	--	--	--	--	--	--	--	--	--	--
Sauk	--	--	1	--	--	2	--	1	6	--	--	2
Trempealeau	16	--	28	--	--	--	--	--	--	--	--	--
Vernon	--	--	--	--	--	--	--	--	--	--	--	--
Total	30	--	276	31	--	28	--	202	139	193	81	16
SOUTHEAST												
Brown	--	--	--	--	--	--	--	6	6	--	--	--
Calumet	--	--	42	--	--	64	--	147	148	--	--	--
Columbia	--	--	335	--	--	--	--	347	186	728	591	--
Dodge	--	--	--	--	--	--	--	--	--	--	--	--
Fond Du Lac	--	--	21	--	--	31	--	72	71	--	--	--
Green	--	--	--	--	--	21	--	14	--	--	--	4
Green Lake	--	--	4	--	--	5	--	14	14	--	--	--
Kenosha	--	--	--	--	--	--	--	--	--	--	--	--
Kewaunee	--	--	--	--	--	--	--	13	14	--	--	--
Manitowoc	--	--	104	--	--	156	--	365	365	--	--	--
Outagamie	90	10	142	168	--	130	--	876	568	91	--	55
Ozaukee	--	--	--	--	--	--	--	--	--	--	--	--
Rock	--	--	--	--	--	--	--	--	--	--	--	--
Sheboygan	--	--	10	--	--	15	--	34	34	--	--	--
Walworth	--	--	--	--	--	--	--	--	--	--	--	--
Waukesha	--	--	--	--	--	--	--	--	--	--	--	--
Winnebago	--	--	--	--	--	--	--	--	--	--	--	--
Total	90	10	658	168	--	422	--	1,888	1,406	819	591	59
State total	22,952	2,546	278,674	35,207	--	31,285	53	209,220	154,313	60,746	15,007	10,884

1/ Includes only those counties that supplied pulpwood in 1988.

Table 13.--Central States pulpwood production by State and destination, 1984-1988

(In thousand standard cords, unpeeled)

Year	Illinois			Indiana			Iowa			Missouri		
		Destination			Destination			Destination			Destination	
	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States
1984	82	29	53	206	56	150	20	14	6	86	32	54
1985	68	25	43	224	68	156	19	13	6	91	27	64
1986	69	30	39	153	64	89	21	17	4	87	26	61
1987	91	35	56	178	76	102	23	23	--	111	29	82
1988	92	38	55	179	73	106	26	26	--	101	24	78

Table 14.- -Trends in receipts of roundwood and residue as pulpwood, Central States, 1984-1988

(In thousand standard cords, unpeeled)

Type of material and area	1984	1985	1986	1987	1988
Roundwood					
Illinois	--	--	--	--	--
Indiana, Iowa, Missouri	62	63	57	67	62
Total	62	63	57	67	62
Residue					
Illinois	--	--	--	--	--
Indiana, Iowa, Missouri	70	73	81	98	99
Total	70	73	81	98	99
All material	132	136	138	165	161

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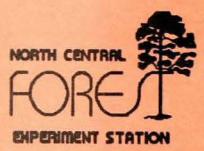
1990. **Pulpwood production in the North Central Region, 1988.** Resour. Bull. NC-123. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 29 p.

Lake States pulpwood production climbed to a record 8.1 million cords. Central States pulpwood production dropped 1 percent from 1987's production of 403 thousand cords. Pulpwood production is shown by county and species group for Michigan, Minnesota, Wisconsin, Iowa, Missouri, Illinois, and Indiana.

KEY WORDS: Roundwood, whole-tree chips, residue, Minnesota, Michigan, Wisconsin, Illinois, Iowa, Indiana, Missouri.

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.